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MARTEN AND FISHER RESPONSE TO CUTOVERS: A SUMMARY OF THE LITERATURE AND RECOMMENDATIONS FOR MANAGEMENT

G. Racey and B. Hessey

INTRODUCTION

Marten (*Martes americana*) and fisher (*Martes pennanti*) are valuable furbearers in Ontario, as well as being important predators in the boreal forest. Both of these species are highly susceptible to trapping, and both inhabit relatively mature, conifer-dominated forests. Fisher, however, will inhabit stands with substantially less conifer composition and will occasionally thrive in hardwood situations. There are documented examples in North America where populations of both have been greatly reduced or extirpated due to human intervention in the natural environment or exploitation of the fur resource (Yeager 1950, de Vos 1952, Brander and Books 1973 and Mech and Rogers 1977). Reintroduction programs and regulation of harvest have restored populations over most of their original range, and populations of both species are the highest this century. Forest managers and the timber industry can help maintain suitable habitat for these furbearers when they manage forest age structure, vegetation composition, stand diversity and stand distribution.

Marten are valuable furbearers in Ontario and important predators in the boreal forest.

The purpose of this note is to briefly summarize the literature on the influence of timber management on marten and fisher. More detailed literature reviews for marten (Hessey and Racey 1989) and fisher (Racey and Hessey 1989) are also available.

FISHER

Fisher avoid recently logged or burnt areas, probably due to lack of cover, food or dens (de Vos 1952). However, fisher populations may not be seriously affected if small clearcuts are well interspersed with large uncut forest stands (Powell 1982).

Potential den sites include large, standing hollow deciduous trees (>50 cm dbh) and openings in rock ledges. Mature to climax successional stages of conifer-dominated mixed forests provide an abundance of den sites for both fisher and porcupines, (*Erethizon dorsatum*) an important prey item. Early successional mixedwood stands with abundant edge will produce an abundance and diversity of small mammals such as snowshoe hare (*Lepus americanus*), mice (*Peromyscus sp*), voles (*Microtus sp*), and small birds; all important foods. A high degree of interspersion of early successional stages that support large small mammal populations, and later successional stages that provide shelter would be of high value to fisher.

A low estimate of home range would indicate that cutting operations should try to maintain suitable habitat to meet all the life requirements of the fisher within each 7-10 km^2 (Allen 1983). The minimum planning area based on the minimum estimated area for a self-sustaining population should be approximately 260 km^2 (Allen 1983).

MARTEN

Marten prefer mature coniferous or mixed forest with at least 50% crown closure (Allen 1982). Clearcutting stands within this forest will increase home range size (Thompson and Colgan 1987) and reduce marten density (de Vos 1952, Thompson and Colgan 1987). Clearcutting may reduce marten densities by 60% of those which can exist on a limited disturbance site (Soutiere 1979, Strickland and Douglas 1983), or 90% of those which can exist in uncut situations (Thompson 1988). Clearcutting also alters the species composition of prey (Soutiere 1979, Martell 1983) and may restrict hunting opportunities, particularly in winter (Steventon and Major 1982) when marten rely heavily upon snowshoe hare (Thompson 1988).

Cover is important for both travel and hunting although open areas will be used occasionally for both, especially in summer. Patches of dense, conifer-dominated mixed stands tend to form core areas (Mech and Rogers 1977, Thompson and Colgan 1987) on which most of the marten's daily activity takes place. The size, shape and juxtaposition of these "habitat islands" within the uncut forest will influence the quality of habitat, size of home range and ultimately the size of the population which can be supported (Allen 1982). Koehler and Hornocker (1977) and Soutiere (1979) suggest a minimum of 25% of the area must be maintained as pole age or older conifer dominated stands to maintain marten populations. Residual blocks of timber ranging in size from 0.03 ha to 13.5 ha were reportedly used by marten (Soutiere 1979) but may not support marten populations if larger continguous blocks of uncut timber are not present.

As with the fisher, marten also require standing or fallen hollow trees for dens in sheltered areas. Insufficient dens could results in reduced recruitment to the population.

CONCLUSIONS

A review of pertinent literature on fisher (Racey and Hessey 1988) and marten (Hessey and Racey 1988) illustrates the importance of modified cutting practices to ensure good marten and fisher habitat. Both old and young stands must be available on each land unit of 3 km^2 implying that the return cut be delayed for 25 years or more. Block cutting patterns which create this situation will minimize the impact of timber extraction. Also, artificially regenerated stands may lack shrub and canopy diversity, and be devoid of standing snags or hollow trees for a substantial period of time. This may produce an environment which is not conducive to large marten or fisher populations, even at an older age. Therefore, there is cause for concern over the impact of timber management on marten and fisher over the long term.

Major gaps in knowledge exist in identifying the relative proximity, size, shape and properties of mature stands required to protect marten and fisher carrying capacity. Inference from the literature would suggest that 25 percent of the forest area in residual blocks of conifer-dominated mixedwoods greater than 25 years of age, with greater than 30 percent canopy closure would be an absolute minimum to support a self-sustaining population of marten. However, featured species management for moose by adherence to the "Guidelines for Providing Moose Habitat in Timber Management" (Ontario 1986) creates habitat patterns which should support strong fisher populations, and in which marten populations could subsist at a lower level for up to 30-40 years after harvest before populations might resume pre-harvest levels.

It is possible that marten could benefit from a habitat management program where cutting plays a major role in providing food, especially snowshoe hare. This could be achieved through a block cutting program. An alternative approach to provide both food and shelter would be a harvesting method that maintains residual stands of 20-50 m^2/ha basal area in pole and larger sized trees (Soutiere 1979). The minimum size of stand is unknown.

The length of time between harvest and when the regenerating stands become suitable for extensive hunting, cover, or maternal denning is not clearly identified in the literature although some authors would indicate that at least 15 years is required (Soutiere 1979, and Steventon and Major 1982). However, 25 years or more may be required to produce the desired canopy closure and 40 years or more may be required to produce a new supply of standing snags or deadfalls for dens. All of these factors should be taken into account when evaluating a cutting plan for its impact on wildlife.

Future research should try to clearly identify the scale of cutting operations, pattern, size, and species composition of uncut blocks, and the best combination of habitat management and trapping management required to minimize the impact of timber management on marten and fisher.

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